



# MISSOURI BOTANICAL GARDEN

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## GEORGE ENGELMANN BOTANICAL NOTEBOOKS

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reach about the 20th of February, 1879. At Calcutta, railway and river facilities will allow excursions to be easily and rapidly made to many of the most interesting portions of India, the excursionists returning to the vessel either at Calcutta, or by crossing the peninsula, to Bombay.

From Calcutta the route proposed will touch at Ceylon and the Laccadive Islands, and reach Bombay about the 1st of April, 1879. Thence, if time permits, a voyage will be made up to the head of the Persian Gulf at the mouth of the Euphrates, whence excursions can be made to Bagdad, and to the ancient ruins of Babylon and Nineveh. The next point will be Aden, on the Straits of Babel Mandeb, and thence through the Red Sea to Suez, about May 1st. During this passage the vessel will touch the coast of Arabia and allow a visit to Mecca. At Suez parties may visit Cairo while the vessel passes through the Suez Canal and along the Mediterranean coast to Alexandria, where

while the members of the expedition



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tion to that part of the island. The northeast portion and the great central plateau of Borneo are unknown, and it is hoped and expected that a party, with the assistance of the Dutch traders and interpreters, will be able to explore them and cross to the west side. All work done here will be a gain to science, not only in the knowledge obtained of the character and condition of the native tribes, and of the animal and vegetable production, but in ascertaining the geographical features of the island, mapping its rivers and lakes, and determining the location and heights of its mountains. The Dyaks report the existence of an interior lake, so large that it takes them three days to cross it in their boats.

During the two months applied to these explorations, the vessel, with those remaining on board, will make various excursions along the Spice Islands in the neighborhood, touching at the

Tristan Island, and the



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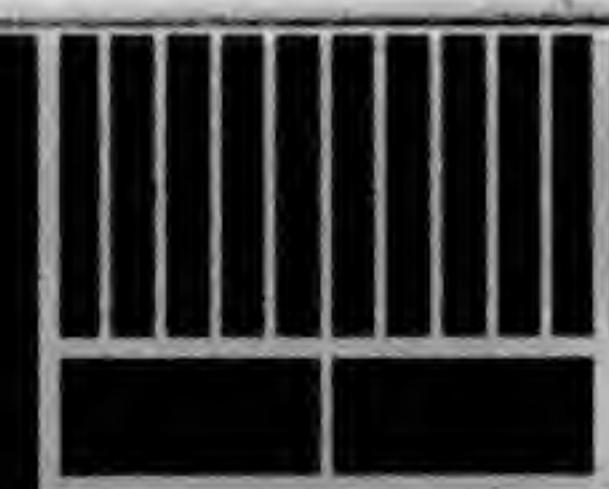
MISSOURI  
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*Pinus Douglasiana* Macbride var. *lutea* 1876  
So. California Head of Pine Creek & Rothrock 1875 No. 251

x2



9 & 11 Cotyled.  
seen in the 2 seeds  
examined



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cm

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**ANEX. LEITCH,  
APOTHECARY & CHEMIST,**

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"P. Monspeliensis" June 10 1879  
H.B. Moore



scarcely any hyphae, except  
around ducts.



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JY

ST. LOUIS, MO.

No. 2600 Loclede Ave., S. W. Gr. Jefferson Ave.

APOTHECARY,  
Hempy T. Bophillings



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*Pinus* near *Massoniana* (?) Nov 14 1879  
Lat. Cones Knobly  
Brown, Griffith 4993 - Hb. Kas 1869

x30



very poor specimen, but dots apparently peripheral, resting on a cushion of hypoderm cells.

These cells sparing in angles and around leaf - but abundant within sheath.

is this anomalous?

leaves 6-8½  
x60 inches long  
cones elongated  
3 inches long  
Knobly  
see figure  
& notes



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8th

## Pinus Austriaca

5645

## JOURNAL OF PROCEEDINGS.

161

reins zur Beförderung des Gartenbaues, 1860, Nos. 1-52—1861, Nos. 1-6, Berlin, *from the Society*; Atti della Societa Ital. di Scienze Nat., Milano, Vol. II., Fasc. 2, 1860, *from the Society*; Atti dell I. R. Istituto Veneto, T. V., Ser. iii., Disp. 10—T. VI., Ser. iii., Disp. 1-3, 1860-1, *from the Society*; Visir-und Recheninstrumente von Ernst Sedlacek, Wien, 1856,—Rechenschieber von E. Sedlacek, Wien, 1856,—Kompendium der ebenen und sfärischen Trigonometrie von E. Sedlacek, Wien, 1856, *from Mr. Senover*; L'Ortolano, Giornale Popolare d'Orticoltura, Trieste, Anno I. 1-12, III. 1-9, 1859-60,—Allocuzione da Prof. Adolfo Stopice, Trieste, 1860, *from the Society*; Fr. Ambrosii Flora Tiroliæ Australis, Vol. II., Pt. 4, *from the Author*; Verhandl. des Naturh. Vereins, Bonn, Jahrg. XVII., 1-2, 1860, *from the Society*; Sitzungsb. der K. K. Akad. der Wissenschaften, Wien, Band XLII., No. 22-28, 1860, *from the Society*; Nachrichten von der Georg-Augusts-Univ. u. der K. Gesellsch. der Wissenschaften, Göttingen, 1860, No. 1-29, *from the Society*; Bull. de la Société Linnéenne de Normandie, Vol. V., 1859-60, Caen, 1861, *from the Society*; Mém. de l'Acad. Imperiale de Metz, Ann. XLII., 1859-60, *from the Academy*; Jahrbücher des Vereins für Naturk. in Nassau, XIV. Heft, Wiesbaden, 1859, *from the Society*; Dr. J. C. Ed. Hoser's Rückblicke, Prag, 1848, von Dr. Weitzenweber,—Sitzungsb. der K. böhm. Gesellsch. der Wissenschaften, Prag, 1859, Juli-Dec.—1860, Jan.-Juni, *from the Society*; I. Bericht des Offenbacher Vereins für Naturk, 1860, *from the Society*; Würzburger Medicin. Zeitschrift, II. Band, 1-2 Hef., 1861, *from the Society*; Der Zoologische Garten, von Dr. D. F. Weinland, Jahrg. II., No. 1-6, 1860-61, *from the Editor*; XX. Bericht über das Museum Francico-Carolinum, Linz, 1860, *from the Institution*; Monatsb. der K. Preuss. Akad. der Wissenschaften, 1860, Berlin,—General Register, 1836-58, Berlin 1860, *from the Academy*; Gelehrte Anzeigen, Vol. 49 & 50,—Sitzungsb. des K. bayer. Akad. des Wissenschaften, 1860, Heft 1-3, München,—Verzeichniss der Mitglieder, 1860,—Bedeutung der Sanskritstudien, von Dr. Wilh. Christ, 1860,—Denkrede auf Alex. von Humboldt, von C. F. P. von <sup>\*\*</sup>, 1860,—Grenzen und Grenze der physikalischen Forsch.

P.

861

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Dr. Koch presented specimens of quartz and of the silicious conglomerate from Madison County mentioned in Dr. Hiltgard's letter.

Dr. Engelmann stated that the mean temperature of July ( $77.5^{\circ}$ ) had been lower than the usual mean of that month, and that the fall of rain during the same month (2.04 inches) was about one-half less than usual.

Dr. Wislizenus stated that the mean of atmospheric electricity of July had been  $3.5^{\circ}$  less than that of the month previous, and that the amount had been gradually decreasing since winter.

August 19, 1861.

The President, Dr. ENGELMANN, in the chair.

Six members present.

A letter was read from A. F. Bandelier, Jr., Highland, Ill., Aug. 1, 1861, communicating meteorological observations at Highland.

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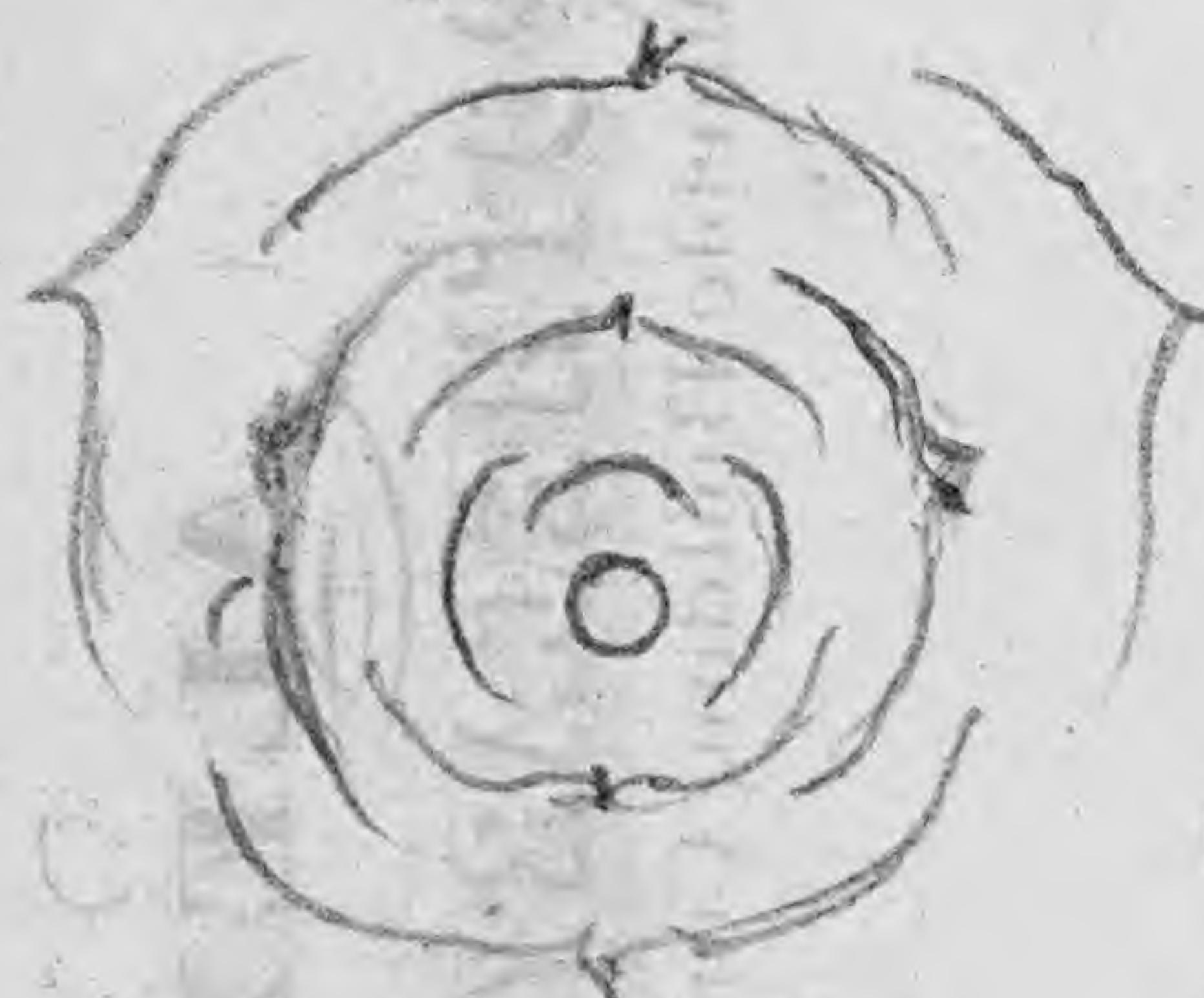
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"Pinus Austriaca"

Oct 10 1863

Hort GöL Neapol. March 8 1858

old amants, adhering,  
to plant.



10(11)  
scales  
H.B. Neapol  
old amants

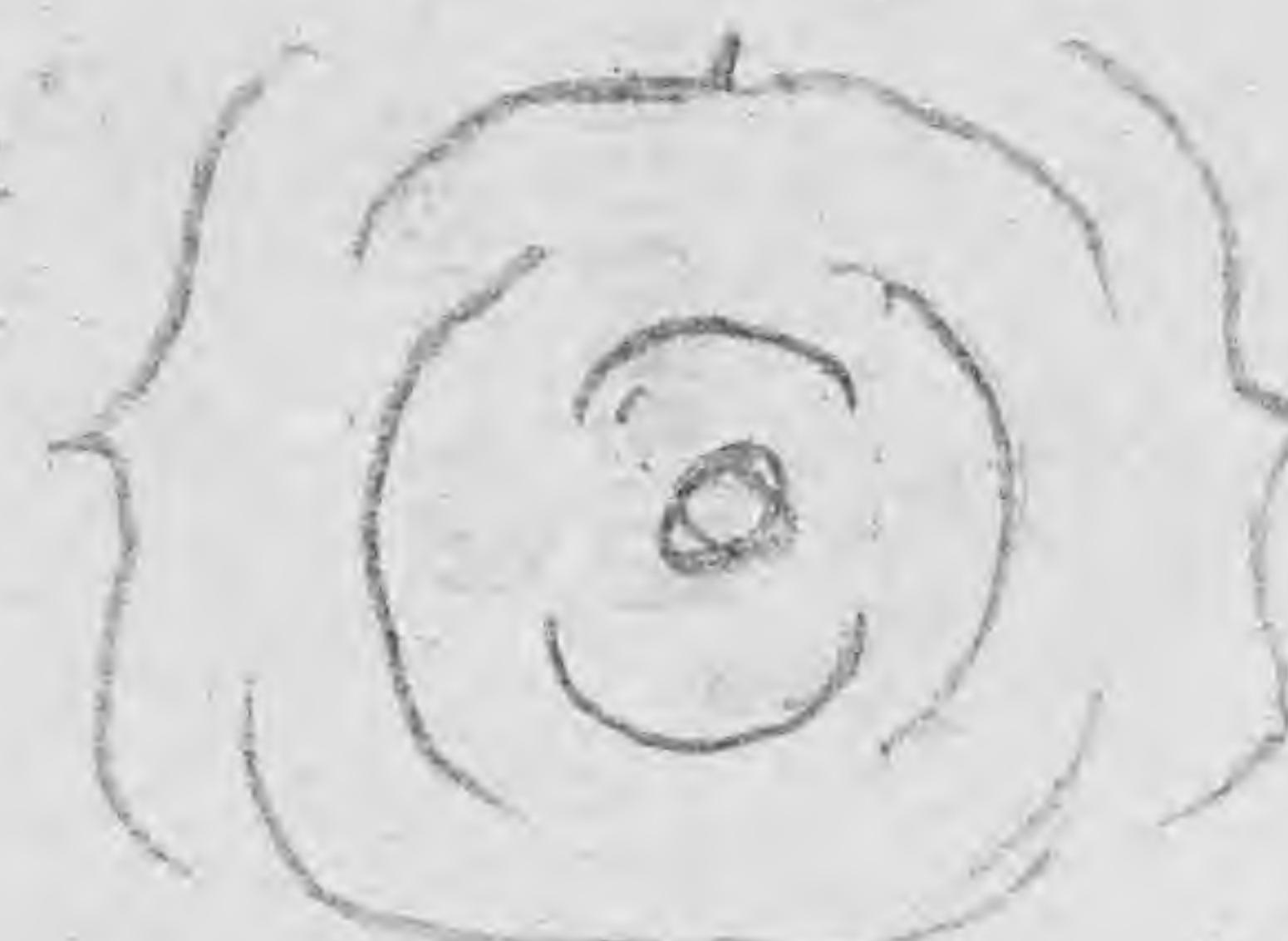
Pollen (very mouldy) x 415

0.028 - 0.033

but with best grains not more than 31-33.



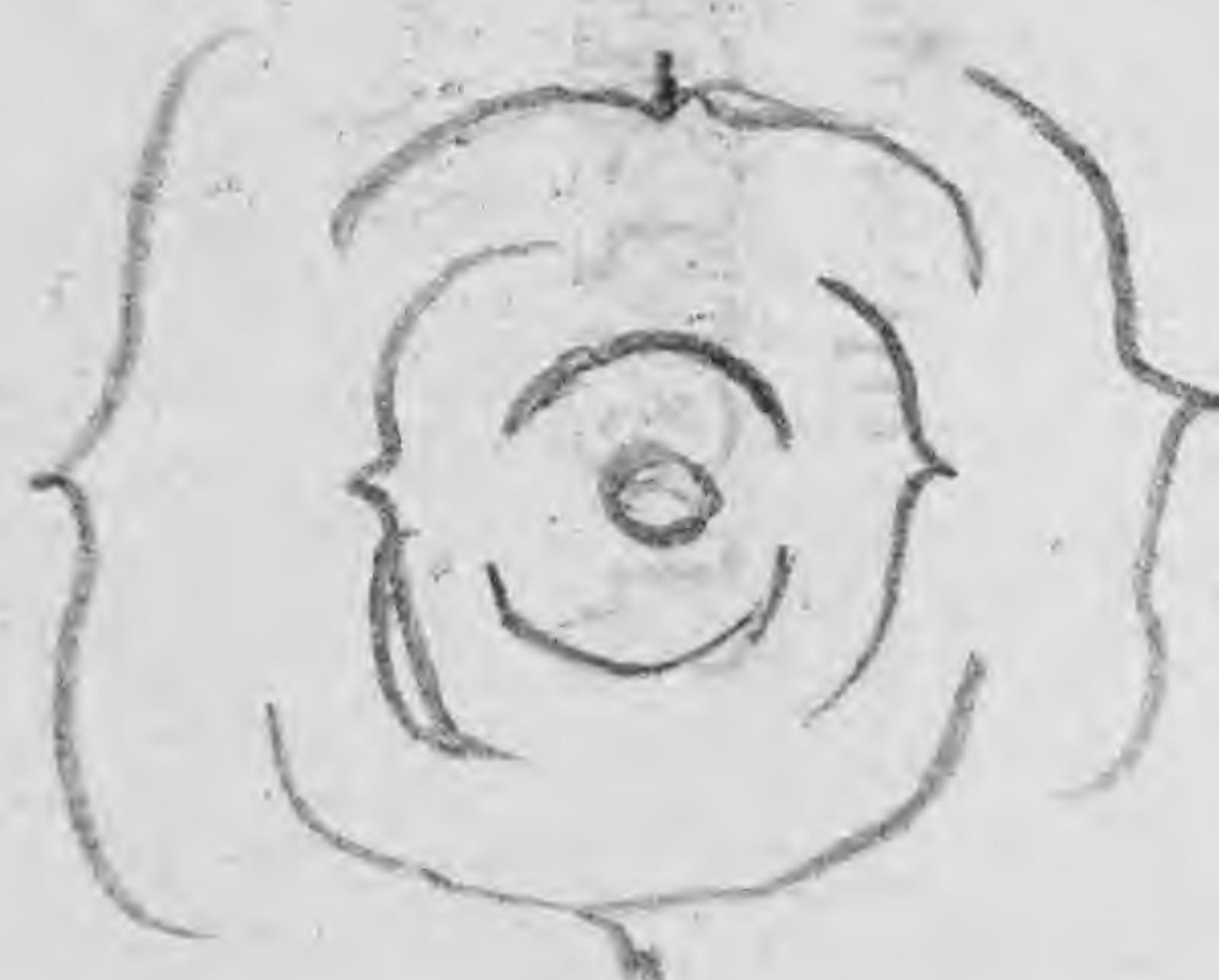
8(-9)  
scales  
H.B. Misso. and 0.043



8 scales

H.B. Cambod.

0.041



8 scales  
H.B. Berlin

0.035 - 0.039



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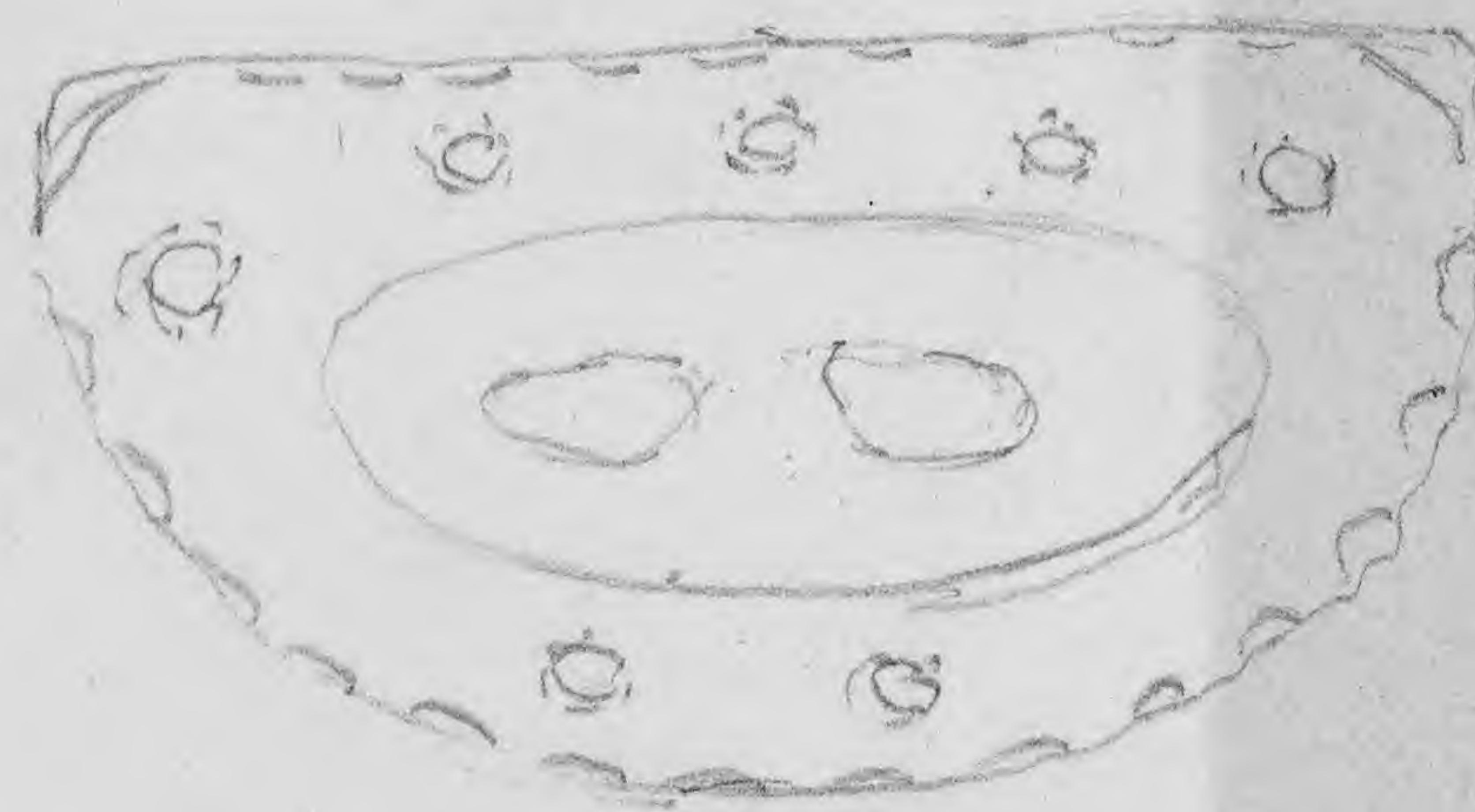


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June 10<sup>th</sup> 1879

*P. australis*

1163. Missouri.



hypodermic canals all around.



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*Tacda* *Conus lateral*  
*foliis tenuis* *Crus* *stamine*  
Sacts parvulus, usually 3 -  
with hypoderm  
left armament, close to mouth  
thus approaching australis

# The Scientific Monthly.

DEVOTED TO THE NATURAL SCIENCES.

VOL. I.

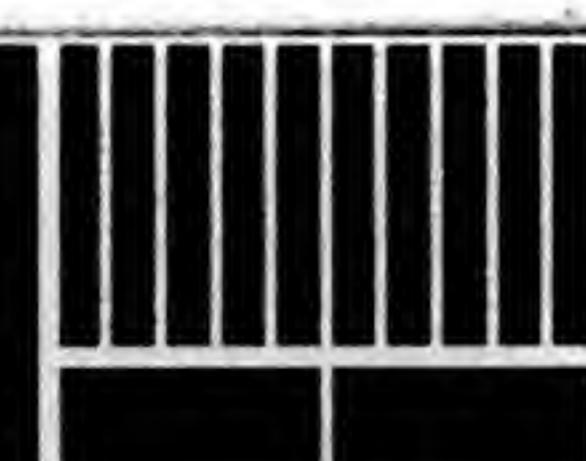
AUGUST, 1876.

NO. II.

## SPRINGS—Continued.

T. A. FELCH, M. D.

Thermal springs afford a very interesting subject of study. Any spring water is regarded as thermal whose temperature exceeds that of the surrounding air or ground. Perhaps 85° F. would be a proper limit to fix as a standard, and all below this must be considered as temperate or cold springs. As may readily be conceived the zone of mean temperature, that is, the distance beneath the surface at which an unvarying temperature is found, varies in different localities. In Great Britain it is between 200 and 300 feet, in Paris about 50 feet and the same distance in many parts of this continent. From that distance as a standpoint it is found that there is a steady increase of temperature of 1° F. for every 52 feet of descent. Therefore it may be said, in a general way, that the degree of warmth shown by the water upon its emergence may be taken as an indication of the depth of its source. But that would be a statement to which there are some exceptions, for there are other causes which influence the amount of heat. First, the water must be thoroughly and equally heated in its subterranean reservoirs; second, it must have a free and direct communication from its origin to its exit; and third, it must be present in such quantities and be expelled with such force as will enable it to retain its heat within itself and impart the least possible amount to the cooler strata and water above. These conditions, accordingly as they are fulfilled more or less perfectly, give us the different grades of thermal springs. All degrees of temperature are represented, from the slightly warm to the boiling water.



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the latitude of New York would give heat enough to boil water at a depth of 8,100 feet, and  $3,000^{\circ}$  F., the fusing point of iron, at a depth of 28 miles."—*Dana*.

The phenomena of the flow of naturally heated water from the earth has been the subject of speculation from a very early date, and attempts have been made to explain it upon the principle of chemical changes taking place beneath the surface of the earth, and many ingenious theories have been advanced in its support. It is assumed that chemical changes take place beneath the surface in local situations, and that these local chemical changes are sufficient to account for the many volcanic actions manifested; and, moreover, that to these chemical changes are attributed all the phenomena of central heat, hot springs, mud volcanoes, etc.

The chemical theory might, indeed, afford a satisfactory explanation of certain phenomena, but the theory most generally entertained and the one, seemingly, most entitled to credit, is that which regards the water as having been rendered warm or hot by contact with the heated strata or lava over which, in its subterranean passage, it courses. That they are of volcanic origin would seem to follow from the fact that they are found in regions of later geological formation, and where the country is of comparative recent volcanic origin.

"The theory of mountain building, advocated by Mrssrs. Hunt, Mallet and Le Conte, call mountain corrugations a result of mechanical work, due to horizontal pressure (a function of the secular cooling of the earth), and announces as a second result of the same work the development of heat in the loci of the work. It is held that in some places corrugation does not take place, but instead, there results a local crushing of the rock, accompanied by sufficient heat to produce local fusion and furnish material for volcanoes. If this be the true theory of volcanoes, then the equilibrium of the heat of the crust may be disturbed by the production of local *maxima*, not only where the rocks are pierced by molten dikes, but also in the places, not necessarily very deep-seated, where lava is found, and also along the axis of corrugation, and these regions would naturally contain hot springs. \* \* \* The most intense action would be produced by recent dikes. Where the discharge is small, and the temperature high, the source of heat cannot be remote, else the heat would have been lost in transit; and, as this is the rule with geysers, they are probably regarded with propriety as strictly volcanic phenomena, indicating the recent injection near the surface of hot lava, whether or not it has been extruded."—*Gilbert*.

And as to the origin of volcanoes, the best received theory is that the center of the earth is in a fiery—a molten state—and that volcanoes are but the openings, chimneys or flues to this central sea of heated molten matter, and that from this source spring all the various phenomena of the increase of heat as we descend beneath the outer crust of the earth—of earthquakes, volcanoes, etc., etc.

A fact that gives strong support to the volcanic origin of thermal springs is that they are found in every instance in what are known as "corrugation" strata

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Nov 14 1870  
*Pinus Pseudo Taeda* Dehnhardt  
Hort Bot Regol 1869

x 70



reets percurrentes  
frequently absent  
very little hypoderm  
- angles

x 60



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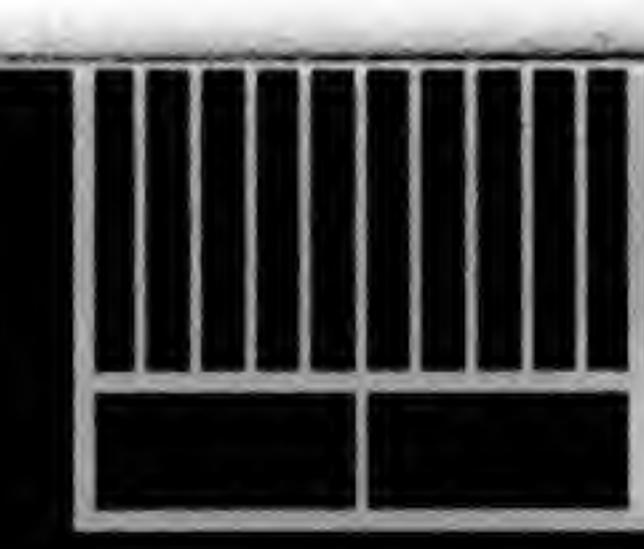
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569-71

## JOURNAL OF PROCEEDINGS.

161

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TRANS. OF THE ACAD. OF SCIENCE.

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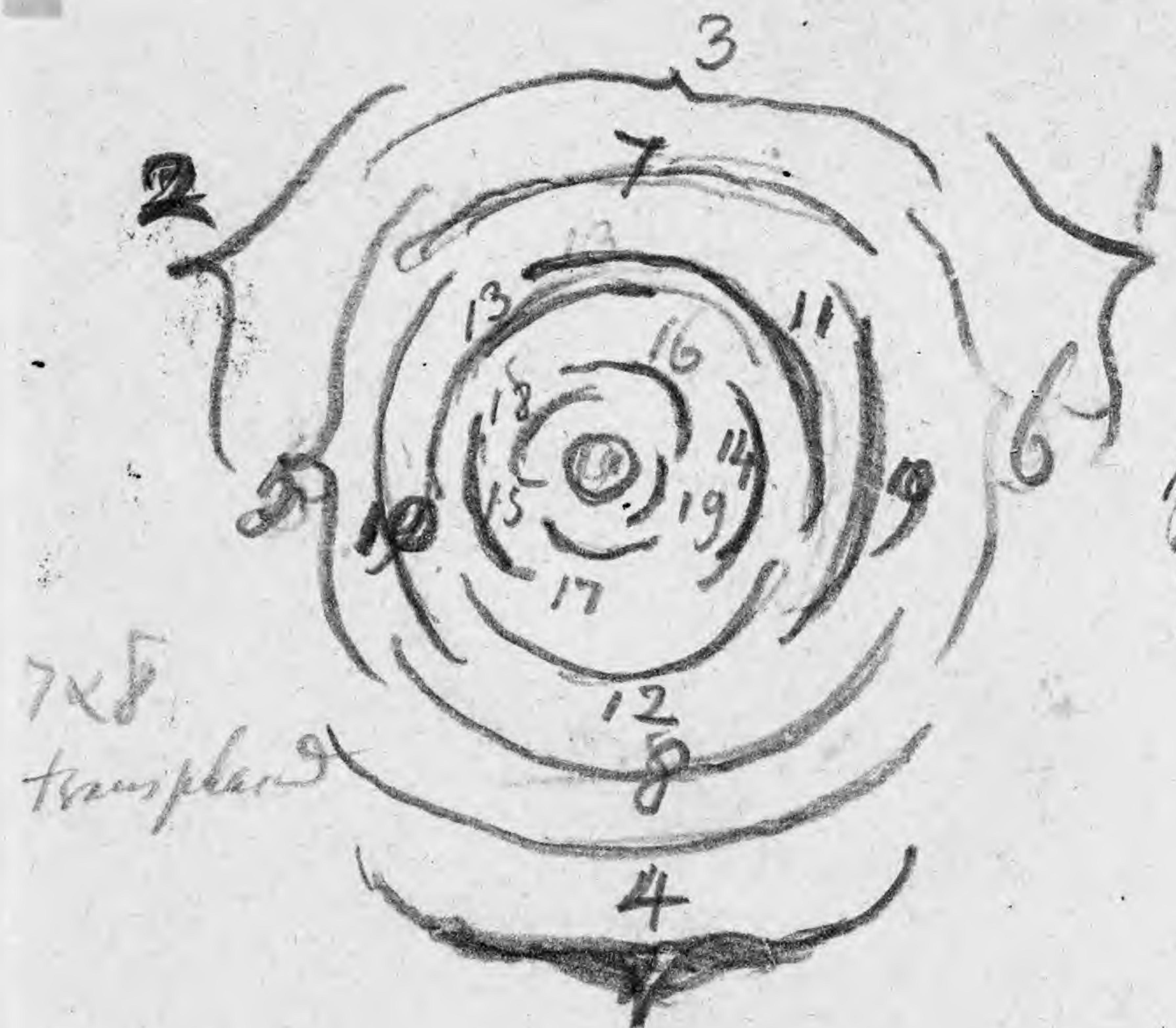


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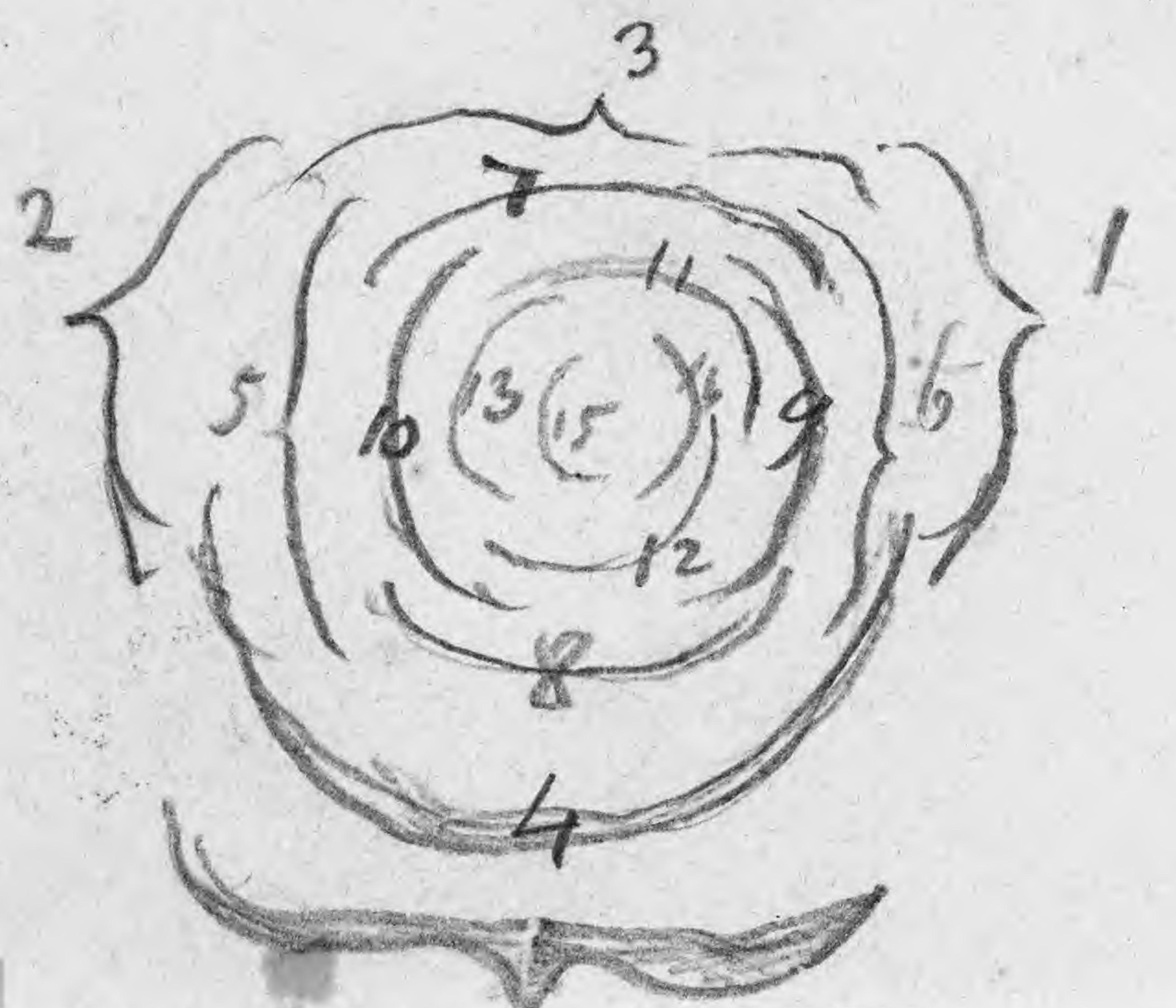
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*Pinus Sabina* Sept 11. 1863  
ex H.B. Karpot's sub nom.  
*P. Pseudostrobos*

position of (15) 19 scales not  
quite correct - that of 1-10  
is correct, 11-19 uncertain

19 woody scales  
of male cone



*Pinus Sabina*  
California 1851

15 scales



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*S. Sabiceum*

Febr 27 1878

x30

Walker Basin, Calif. - Not work



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Herbary T. R. Robinson 1899

APOTHECARY,

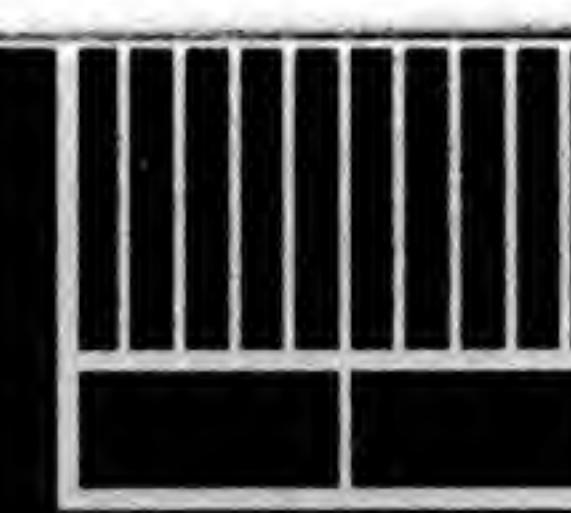
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J. J.

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Geo. Engelmann, M. D.,

No. 3003 Locust Street.

DeCandol's species

Aug 1863

John S. Johnson

minutely annulate surface

Region of leaf 11-14 lines long leaves 8-11 " long  
seed <sup>(4.112)</sup> 10 lines long, not cylindric, only 4 lines - dark  
wing about 4 lines long, 4-5 lines wide, not half as  
long as seed itself.



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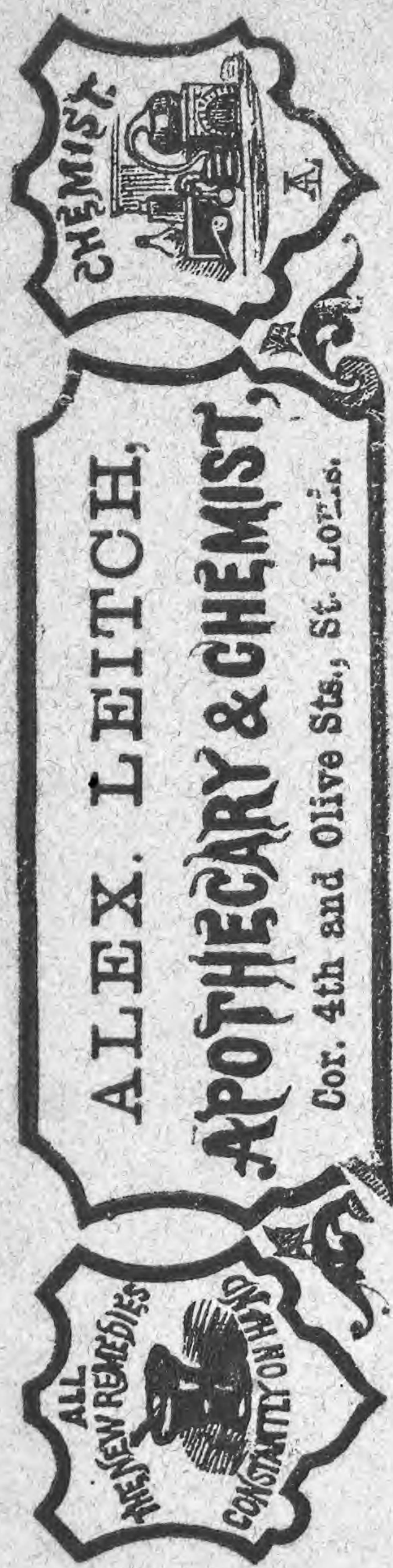
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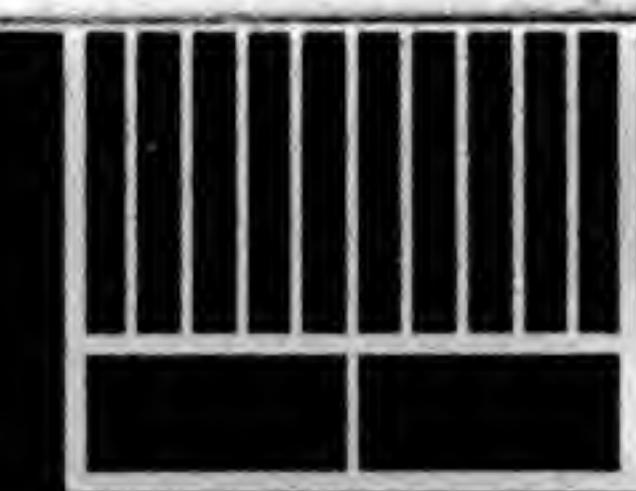


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rdinalis, sont a-  
ut et -sues et nombreux, variées  
au rouge cocciné, et du lilas au violet clair et  
violet bleutâtre. Cette nouvelle race est rustique,  
très-florifère et très-ornementale. La floraison  
dure de juillet en octobre.

### MYOSOTIS

32134 ~~des Alpes~~ **main rose** ○ 2 . . . . . 1 50

Bonne petite plante naine, touffue, couverte de  
jolies fleurs roses; très-recommandable pour les  
bordures ou l'ornementation des plates-bandes.

### ŒILLET DE CHINE

32412 **double à large feuille rouge**  
**foncé** ○ ○ . . . . . 1 50

Cette variété est remarquable par le beau  
coloris rouge pourpre foncé de ses fleurs; la  
plante, qui a environ 30 centimètres de hauteur,  
se couvre abondamment de belles et grandes  
fleurs doubles, et conviendra particulièrement  
pour corbeilles ou contrastes de couleurs.

### ŒILLET D'INDE

32582 **double très-nain jaune d'or à**  
**centre brun** (*Tagetes patula*  
*pulchra nana*) ○ . . . . . 1 50

Cette jolie variété nous est venue d'Allemagne  
il y a deux ans, et, l'ayant reconnue dans nos  
cultures comme une plante réellement intéressante  
et méritante, nous n'avons pas hésité à  
l'adopter dans notre collection. La plante est  
tout à fait basse, ne dépassant pas 20 centimètres  
de hauteur, et se couvre d'une profusion  
de fleurs doubles, d'un beau jaune d'or avec  
centre ou cœur brun: contraste qui est du plus  
bel effet. C'est une plante surtout recommandable  
pour bordures.

ante.  
ir; boni-

256  
23417 **à grande fleur rouge éclatant**  
**à œil blanc** (*Ph. Drum. grandiflora splendens*) ○ . . . . . 1 50

Cette variété, aussi remarquable par les  
grandes dimensions de ses fleurs que par la richesse  
de leur coloris rouge éclatant à œil blanc,  
produit un effet splendide; nous la recommandons  
très-chaudement; on pourra en tirer un parti  
avantageux, soit en en faisant des corbeilles,  
soit en l'associant à d'autres plantes de même  
taille et de coloris différents.

33419 **à grande fleur violet étoilé**  
**blanc** ○ . . . . . 1 50

C'est encore un magnifique coloris fixé dans cette  
belle race, et dont l'emploi sera précieux dans  
l'ornementation des plates-bandes ou massifs.

### REINE-MARGUERITE

g34417 **demi-maine multi-fleur blanche**  
○ . . . . . 1 50

Ce coloris manquait dans cette jolie race multi-  
fleur, une des plus belles parmi les Reines-Marguerites,  
et qui, par sa taille demi-maine, peut  
être si diversement employée dans l'ornementa-  
tion des parterres.

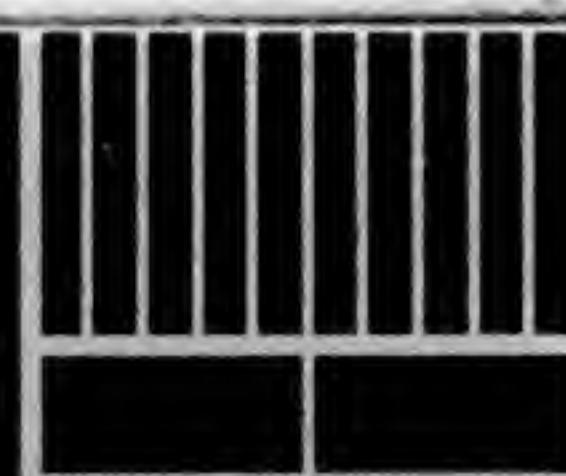
34553 **à fleur de Pivoine gris de Lim** ○ 1 50

34557 — — **Magenta** ○ . . . . . 1 50

Deux belles et jolies variétés de Reine-Marguerite  
bien distinctes et bien fixées, à fleurs glo-

34595 **perfection cramoisie** ○ . . . . . 1 50

Variété distincte, d'un beau rouge cramoisi-  
très-recommandable.



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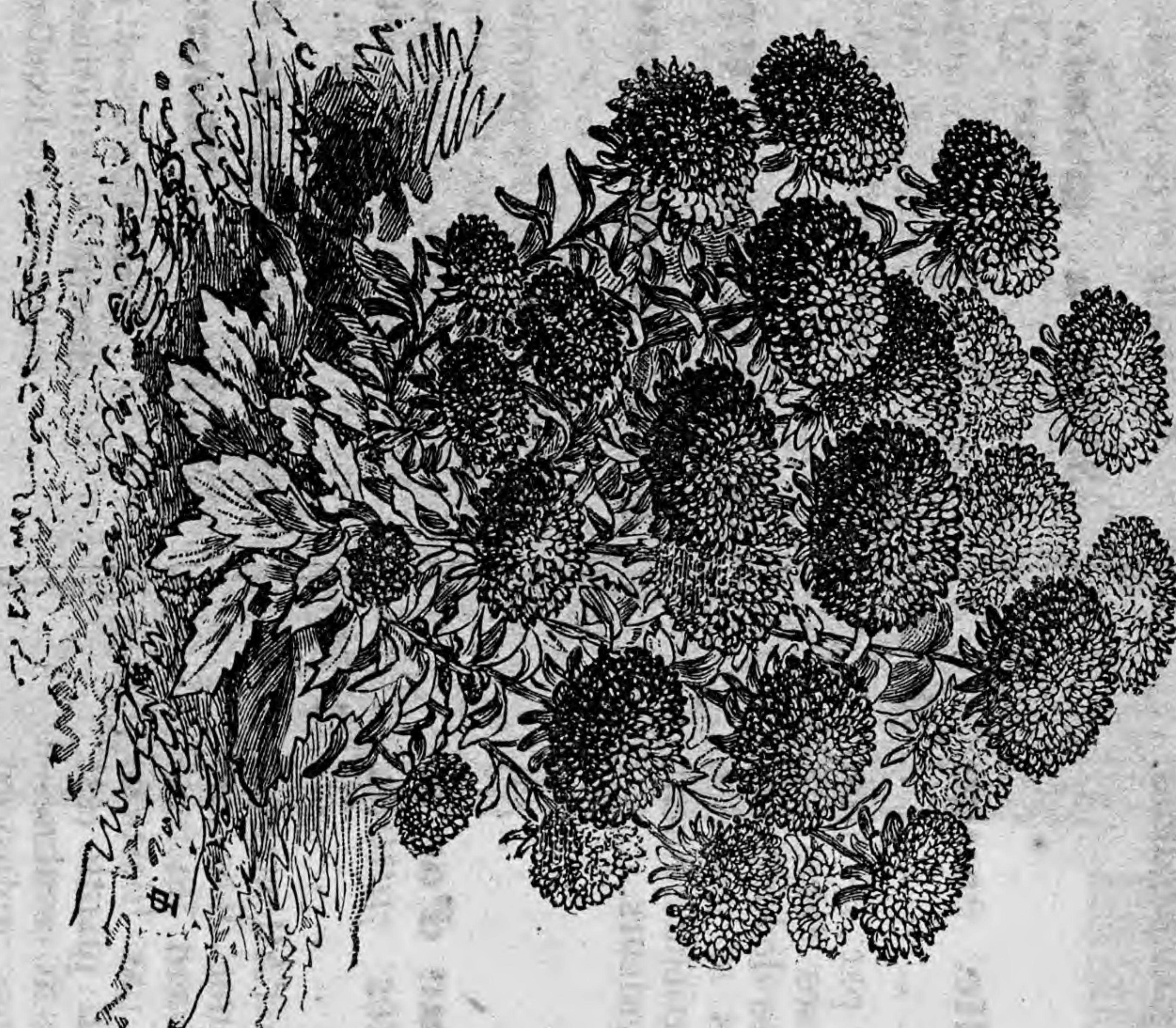
MISSOURI  
BOTANICAL  
GARDEN

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Variété pour fixe, différente de la S. coccinea naine par la couleur de ses fleurs, qui sont d'un beau rose cocciné clair. La plante, également plus naine, plus florifère et d'un port buissonnant, se recommande surtout pour faire des massifs, ou pour orner les plates-bandes. Floraison de juillet en octobre.

11643

anifications nombreuses et denses, hautes de 75 centimètres, à fleur petite, jaune, simple, et à disque brun. Rustique et de culture facile, elle est surtout intéressante par sa floraison, qui se prolonge jusqu'en plein automne.



Reine-Marguerite multiflore.

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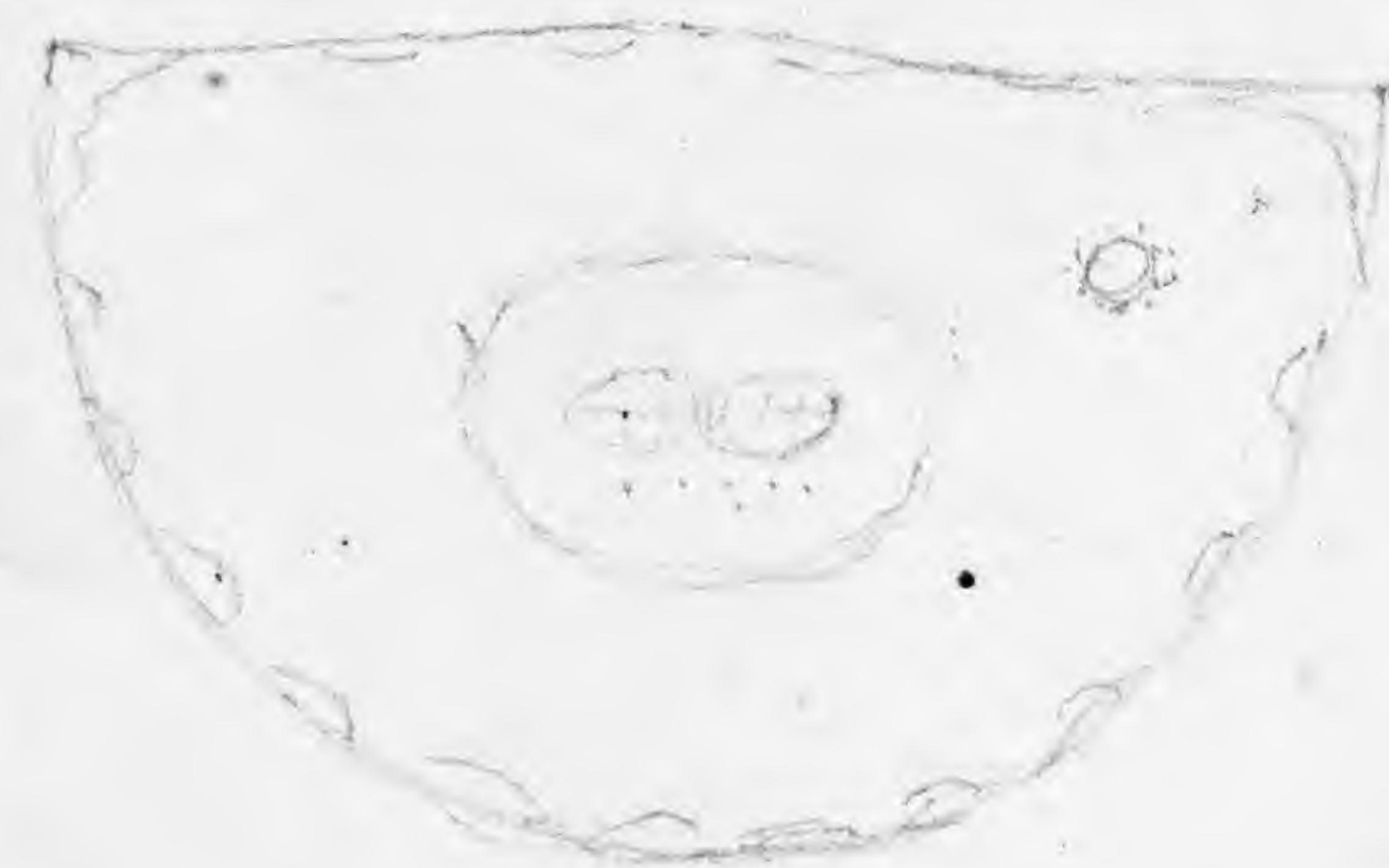
Thunbergii

("Pin drusiflora")

Hooper coll., publ., 2ly 78

July 9 1878

x 30



hypoderm bundles ill defined  
but much less on upper surface  
than on back.

ducts mostly wanting - for  
only one - a few sections - parenchyma  
surrounded by hypoderm.

hypoderm scant in the sheath.



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11644

ARTHUR T. HOLLISTER,  
Druggist,

301 South Fifth, S. W. Cor. 5th & Myrtle, St. Louis, Mo.

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*P. Theobergii*

Burma, Griffith 4993 - No Flw 1869

May 16 1879

- No Flw 1869

$\times 30$



parasitizing duct,  
2 primary, 1 or 2 secondary  
tissues, I can find no  
hypoderm around duct; peripheral  
bundles of hypoderm not strong,  
about 4 above, 8 below, and the angles  
some hypoderm cells in the sheath

$\times 30$

Reexamined Dec 3<sup>rd</sup>, find the same

$\times 60$

cone hardly  
elongated, 3" long

leaves slender

12-23 cm

long

(6-8 $\frac{1}{2}$  inches)



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11645

Henry W. Bonnington  
APOTHECARY.

No. 2600 Faedde Ave., S. W. Cor. Jefferson Ave.  
ST. LOUIS, MO.

MISSOURI BOTANICAL GARDEN  
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*Pinus Chi-huahuana* Eng.

Wright M 1888

leaves  $2\frac{1}{2}$  - 4 inches ~~acuminate~~

in 3" rarely in 4"

sheaths very lax, 6" long, perpendicular ~~fills the~~  
almost entire bracts through the 2" sum., after that  
entirely divided, as in Strob.

axis of male infloresc. 5-6 l. long

about same length with involuc. scales

—

My spec'm has male & female fl. on same branch  
female anthers subterminal; as a  
census I take it that ~~the~~ male anthers are  
interspersed with the leaves <sup>in the middle</sup> of this sprig's shoot  
not at the base of it.



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GEORGE Engelmann Papers

11641

**ALEX. LEITCH.**  
**APOTHECARY & PHARMACEUTIST**  
Marble Building Cor Fourth & Olive Sts. St. Louis, Mo.



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forests, glades  
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S 245. Publications.—1. *Field and Forest*. The Jan. and Feb. Nos. give some account of the Flora of Martha's Vineyard and vicinity, by Rev. Thomas Morong; the March No., Addenda to the Flora Columbiana, 1084-1142. Mr. Ward has found *Polypodium vulgare* growing on the living bark of *Betula nigra*, several feet above the base, after the manner of *P. incanum*. 2. The *Botanical Gazette* for February and March concludes Dr. Chapman's long list of new Southern (chiefly South Florida) plants. Dr. Vasey describes *Poa Lemmoni*, a new species from Sierra Co., Cal. Mr. Bebb finds that *Salix cordata*, var., *glaucophylla* of Babcock's Chicago catalogue, corresponds so closely with *S. Barclayi*, And., that either the latter should be reduced to *S. cordata*, or the former to *S. Barclayi*, var. *grandifolia*. *S. Barclayi* was found by Kellogg in Alaska. Mr. J. Wolf gives a list of 61 Lichens of Southern Illinois. Several writers discuss the question "Whence the seeds" of plants that seem to spring up spontaneously in new clearings. Mr. Lemmon writes on the Flora of the Great Basin. In the April No., among many interesting notes, including Bryological by Mr. Austin, and Mycological (new Colorado Fungi) by Mr. Peck, we find Mr. Curtiss recording Mistletoe parasitic on itself, and Dr. Rothrock recommending a convenient dissecting microscope, made by Zentmeyer, of Philadelphia, for fifteen dollars, or sixteen dollars with an extra lens. In the May No., Dr. Gray accepts Mr. A. Common's description of two forms of the common Plantain; *P. Major*, L., the smaller obtuse form; *P. Rigelii*, Decaisne, the larger acute form, with leaves generally smooth: spikes longer tapering to a point node lessened



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*ponderosa*  
*Jeffreyi*

the middle of the month, quite a bed of *Lipparis liliifolia*, Rich., quite near Larchmont Station, N. H. R. R. We are reminded, thereby, that a lady showed us this spring from Premium Point, in the same neighborhood, *Smilacina stellata*, Desf., *Uvularia perfoliata*, L., and *Castilleja coccinea*, L. Mr. Le Roy showed us lately where *Bellis perennis*, L., had established itself in the grounds of Columbia College.

S 244. **Townsendia.**—I have received a dozen or more fresh specimens of *Townsendia Wilcoxiana*, first noticed in the BULLETIN, Vol. 6, p. 163. They come from Dr. T. E. Wilcox, U. S. A., Camp Supply, Indian Territory. They conform precisely with the *one* original specimen, and description. All bear simply one head. None show any tendency to lose or shorten the pappus of the ray florets, which is quite as copious as that of the disk.

This genus was founded chiefly on the inequality of the pappus in the ray and disk. Now in this new species, this inequality vanishes, and the question arises, can the genus be still maintained? Are there other distinctive marks between *Townsendia* and *Aster*? There are. Our plant, like other *Townsendias*, is distinguished by its remarkable habit, being stemless, with the leaves and head closely radical. The involucre scales are scarious-edged, fringed, and colored, never green-tipped. The rays are bifid at end, the disk corollas *white* with the five teeth brown, never yellow. Pappus bristles flatt certainly no

S 245. V

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spider  
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forests, glades  
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imes its flight  
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Thus this little  
; dormant and  
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and then for a

two to five at a  
she meets with,

time. The female  
where, fastening herself by her hooks to the wall of her apartment, she permits her  
and in this manner to continue for the first or second

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11648

beginning March 10th, 1878, but for convenience in columns, the others in pairs, excepting May 4th. slow. It appears to the earlier date. A vertical line separates the columns with facility.



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William C. Heron

22 *Planus* 20 *Antennulae*

# JOURNAL OF PROCEEDINGS.

191

th. It first appears early in summer, lying dormant ~~until~~ <sup>until</sup> the beginning of its flight in the dusk of the evening, frequenting the edges of forests, glades

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B O T A N I C A L  
M I S S O U R I

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11649

162

TRANS. OF THE ACAD. OF SCIENCE.

Dr. Koch presented specimens of quartz and of the silicious conglomerate from Madison County mentioned in Dr. Hiltgard's letter.

Dr. Engelmann stated that the mean temperature of July (77.5°) had been lower than the usual mean of that month, and that the fall of rain during the same month (2.04 inches) was about one-half less than usual.

Dr. Wislizenus stated that the mean of atmospheric electricity of July had been 3.5° less than that of the month previous, and that the amount had been gradually decreasing since winter.

—  
August 19, 1861.

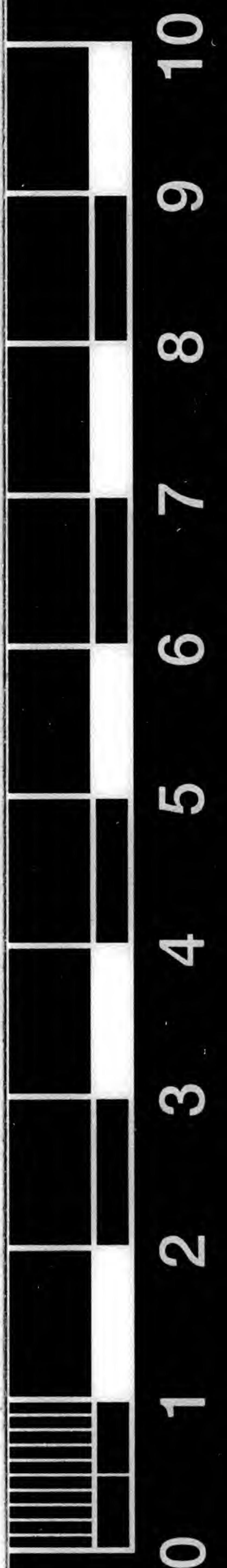
The President, Dr. ENGELMANN, in the chair.

Six members present.

A letter was read from A. F. Bandelier, Jr., Highland, Ill., Aug. 1, 1861, communicating meteorological observations at Highland.

Donations to the library were received:  
Géologique de France, Ser. ii., T. XVIII., Feuilles  
1861, from the Society; Proc. Amer. Phil. Society,  
Dr. C. A. Ad. Nat. Sciences, Philad.,  
nig von Bayern o. der  
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*Subropical* *pondorosa*  
*Dnts. parenchymat* fol 2-3 *survived by hypon*

THE SCIENTIFIC MONTHLY.

first appearance early in summer, lying dormant during the winter months. It begins its flight in the dusk of the evening, frequenting the edges of forests, glades and shady walks, and is also observed to skim over the surface of sheets of water. It pursues gnats, moths, and nocturnal insects of all kinds. If it happens to be interrupted in its flight and falls to the ground, it speedily resumes its flight arising with facility into the air. Its movements upon the ground are awkward and slow. It appears only in the most pleasant evenings, when its prey is generally abroad, and flies in pursuit with its mouth wide open. Thus this little creature spends but a short portion of its existence in action, lying dormant and concealed in some cave or hollow tree during winter, and sleeping throughout the hours of daylight, only venturing forth in calm, pleasant nights, and then for a short time only, retiring soon to its retreat to rest and sleep.

The bat couples and brings forth in summer, generally from two to five at a time. The female makes no nest, but is content with the first hole she meets with, where, fastening herself by her hooks to the wall of her apartment, she permits her young to hang at the nipple, and in this manner to continue for the first or second day, when after some time, the mother becoming hungry, she takes her little ones

161

561

13. Chihuahua

11650

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GEORGE ENGELMANN PAPERS

530

# THE SCIENTIFIC MONTHLY.

The second group comprise the true insectivorous bats, consisting of the genera, *vespertilio*, *phyllostoma*, *nycteris*, *atalapha*, *corynorhinus*, etc.

In general, the skeleton of the bat combines strength and lightness. The head is somewhat elongated (the longest in the fruit-eating bats). The portion of the temporal bone containing the organ of hearing is much developed. All have canine and incisor teeth, the latter varying in number from two to four in the upper and from two to six in the lower jaw. The molars also vary from three to six in each jaw. The vertebra of the neck are very broad; those of the back and loins simple, almost without spinous processes and much compressed at the sides. The sacrum is very long and narrow. The tail, when present, is short and used to extend the inter femoral membrane and direct the flight. The ribs and breast bone are long, the upper portion of the latter greatly expanded laterally to give a firm support to the strong collar bones. It has a raised ridge or keel in front, the same as in birds. The shoulder blade is highly developed, the arm bones greatly lengthened and very slender. The fore arm consists of the usual two bones, but the ulna is quite rudimentary, being also united to the radius. The radius is very

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TRANS. OF THE ACADEM. OF SCIENCE. 162

Dr. K. Koch presented specimens of the siliceous quartz and of the siliceous conglomerate from Madison County in conglomeration, 1852.

gardo's letter. Dr. Engelmann stated that the mean temperature of July had been lower than the usual mean of (77.5°) during the fall of rain and about one-half less than usual.

Dr. W. J. L. Gatz stated that the mean of atmospheric pressure in July had been  $3.5^{\circ}$  less than that of the previous and had been gradually decreasing since winter.

August 19, 1861.

the President, Dr. ENGELMANN, in the chair.

Dr. ENGELMANN,

SIX members present.  
A letter was read from E. E. Bandelier, Jr., Highland, N. Y., concerning meteorological observations at 1861, communicating the same.



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